applying the scale factor $\frac{Q(HL_k)}{\sqrt{Q(LL_k)}}$ to each filter coefficient in the high pass filtering operation over the HL_k and HH_k subband;

$Q(HL_k)$ and $Q(LL_k)$ being the quantization thresholds of the subbands, HL and LL in the k^{th} level, respectively, K being the total level of the DWT, k being a positive integer less than or equal to K, $Q(LL_k)$ being 1 when k is less than K, and LL_1 being the input image.

REMARKS

The above-referenced patent application has been reviewed in light of the Office Action, dated March 21, 2003, in which claims 1, 2 and 24 are rejected under 35 USC 102(a) on Shishikui et al. (US Patent No. 5,534,927; hereinafter "Shishikui"); claims 3-9, 12-23 and 25-29 are rejected under 35 USC 103(a) as being unpatentable over Shishikui in view of Acharya (US Patent No. 5,875,122; hereinafter "Acharya"); and claims 10 and 11 are objected to and would be allowable if rewritten in independent form. Reconsideration of the above-referenced patent application is respectfully requested.

Claims 1-31 are pending in this above-referenced patent application. Claims 1, 3, 17, 19, 24 and 25 have been amended. Claims 30 and 31 have been added. No claims have been cancelled.

STATEMENT OF COMMON OWNERSHIP

The above-referenced application and Acharya (US Patent No. 5,875,122) were, at the time the invention of the above-referenced application was made, owned by Intel Corporation. This disqualifies Acharya from being used in a rejection under 35 USC 103(a) against the claims of the above-referenced application.

RESPONSE TO 35 USC 102(a) REJECTION

The Examiner rejected claims 1, 2, and 24 under 35 USC 102(a) as being anticipated by Shishikui. This rejection of these claims on this basis is traversed.

It is noted that to make a prima facie rejection under section 102 of the patent statute, the Examiner must provide a single prior art document that includes each and every element and limitation of the rejected claim or claims. It is respectfully asserted that the Examiner's rejection fails in this regard. For example, claim 1, as amended, recites in part that the transform process comprises an inverse discrete wavelet transform (IDWT) to decompose signal samples into two or more subbands.

The Examiner points to Figure 1 and col. 6, lines 39-479 of Shishikui. However, even assuming, without conceding, that what is described in the cited patent refers to a method of inverse quantizing quantized signal samples of an image during image decompression, the cited patent fails to comply with this claim language. There is nothing in the cited patent to indicate that the transform process comprises an inverse discrete wavelet transform (IDWT) to decompose signal samples into two or more subbands.

The above is believed sufficient to overcome the Examiner's rejection, although it is believed that there are other limitations in claim 1 that the cited patent also fails to meet. Likewise, claims 2 and 24 either depend from or include similar limitations to claim 1. Therefore, these claims distinguish from the cited patent on at least the same or a similar basis as indicated above regarding claim 1. It is therefore respectfully requested that the Examiner withdraw his rejection as to these claims.

RESPONSE TO 35 USC 103(A) REJECTION

The Examiner rejected claims 3-9, 12-23 and 25-29 under 35 USC 103(a) as being unpatentable over Shishikui in view of Acharya. This rejection of these claims on this basis is traversed.

As indicated above, Shishikui fails to meet the limitations of claim 1. As noted above, Acharya is not a proper reference under section 103 because the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Even if the combination were proper, which is disputed, it would fail to meet the limitations of claim 1. Thus, the combination would also fail to meet at least these missing limitations for any claims that depend from claim 1 and would also fail to meet any limitations of any claims where the limitations of those claims are similar to the missing limitations of claim 1, such as those discussed above.

Furthermore, if one of ordinary skill had both Acharya and Shishikui before him or her, he or she would still be unable to produce the subject matter of the rejected claims. The Examiner has not shown otherwise.

The Examiner's arguments regarding the rejected claims are mooted. It is respectfully requested that the Examiner withdraw his rejection of these claims.

NEW CLAIMS

The Examiner stated that claims 10 and 11 are objected to as dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. New claims 30 and 31 include the allowable subject matter noted by the Examiner in claims 10 and 11, respectively.

Attorney Docket. No. 042390.P8350

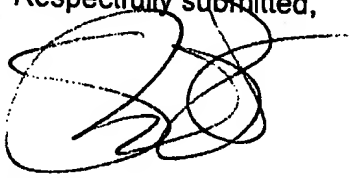
CONCLUSION

It is respectfully asserted that all of the claims pending in this patent application are in condition for allowance. If the Examiner has any questions, he is invited to contact the undersigned at 310-252-7605. Reconsideration of this patent application and early allowance of all the claims is respectfully requested.

Claims 1-31 are pending in the application. Claims 30 and 31 have been added. No claims have been added. To date, Applicants have paid the filing fee that allows the application to have three (3) independent claims and a total of twenty-nine (29) claims. With this response, two (2) independent claims have been added. The application now contains a total of five (5) independent claims and a total of thirty-one (31) claims. An additional fee is enclosed.

Should it be determined that an additional fee is due under 37 CFR §§1.16 or 1.17, or any excess fee has been received, please charge that fee or credit the amount of overcharge to deposit account #02-2666.

Respectfully submitted,



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Kumiko 5/1/03
Signature Date

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) A method of inverse quantizing quantized signal samples of an image during image decompression comprising:

applying a process to transform the quantized signal samples from a first domain to a second domain, the transform process comprises an inverse discrete wavelet transform (IDWT) to decompose signal samples into two or more subbands; and

during the transform process, filtering quantized signal samples by applying scaled filter coefficients, the signals samples first being filtered along the image in a first direction and then along the image in a second direction, so that at the completion of the transform process of the image, at least a selected portion of the transformed signal samples are inverse quantized.

3. (Amended) The method of claim 1, wherein [the transform process comprises an inverse discrete wavelet transform (IDWT),] the first domain is the frequency domain, the second domain is the spatial domain, the first direction is one of row-wise and column-wise, and the second direction is the other of row-wise and column-wise.

17. (Amended) A device comprising:

an integrated circuit;

said integrated circuit having input ports to receive signal samples associated with at least one image;

said integrated circuit including digital circuitry;

said digital circuitry having a configuration to apply a process to transform the signal samples from a first domain to a second domain and during the transform process, filtering signal samples, by first applying scaled filter coefficients to signal samples along the image in a first direction and then applying scaled filter coefficients to signal samples along the image in a second direction, at least a selected portion of the transformed signal samples are inverse

quantized, the transform process comprises an inverse discrete wavelet transform (IDWT) to decompose signal samples into two or more subbands.

19. (Amended) The device of claim 17, wherein [the transform process comprises an inverse discrete wavelet transform (IDWT),] the first domain is the frequency domain, the second domain is the spatial domain, the first direction is one of row-wise and column-wise, and the second direction is the other of row-wise and column-wise.

24. (Amended) An article comprising: a storage medium, said storage medium having stored thereon, instructions, that when executed by a system to execute said instructions, results in:

applying a process to transform signal samples associated with at least one image from a first domain to a second domain, the transform process comprises an inverse discrete wavelet transform (IDWT) to decompose signal samples into two or more subbands; and

during the transform process, filtering signal samples, by first applying scaled filter coefficients to signal samples along the image in a first direction and then applying scaled filter coefficients to signal samples along the image in a second direction, so that at the completion of the transform process of the image, at least a selected portion of the transformed signal samples are inverse quantized.

25. (Amended) The article of claim 24, wherein [the transform process comprises an inverse discrete wavelet transform (IDWT),] the first domain is the frequency domain, the second domain is the spatial domain, the first direction is one of row-wise and column-wise, and the second direction is the other of row-wise and column-wise.

30. (New) A method of inverse quantizing quantized signal samples of an image during image decompression comprising:

applying a process to transform the quantized signal samples from a first domain to a second domain; and

during the transform process, filtering quantized signal samples by applying scaled filter coefficients, the signals samples first being filtered along the image in a first direction and then along the image in a second direction, so that at the completion of the transform process,

of the image, at least a selected portion of the transformed signal samples are inverse quantized,

scaling in a first mutually orthogonal direction comprises:

applying the scale factor $\sqrt{Q(LL_k)}$ to each filter coefficient in the low pass filtering operation to subbands LL_k and HL_k;

applying the scale factor $\frac{Q(LH_k)}{\sqrt{Q(LL_k)}}$ to each filter coefficient in the high pass filtering operation to subband LH_k; and

applying the scale factor $\frac{Q(HH_k)\sqrt{Q(LL_k)}}{Q(HL_k)}$ to each filter coefficient in the high pass filtering operation to subband HH_k;

$Q(HL_k)$, $Q(HH_k)$, $Q(LH_k)$, and $Q(LL_k)$ being the quantization thresholds of the subbands, HL, HH, LH, and LL in the k^{th} level, respectively, and $Q(LL_k)$ being equal to 1, when level k is less than K.

31. (New) A method of inverse quantizing quantized signal samples of an image during image decompression comprising:

applying a process to transform the quantized signal samples from a first domain to a second domain; and

during the transform process, filtering quantized signal samples by applying scaled filter coefficients, the signals samples first being filtered along the image in a first direction and then along the image in a second direction, so that at the completion of the transform process,

of the image, at least a selected portion of the transformed signal samples are inverse quantized,

scaling in a second direction comprises:

applying the scale factor $\sqrt{Q(LL_k)}$ to each filter coefficient in the low pass filtering operation over the LL_k and LH_k subband; and

applying the scale factor $\frac{Q(HL_k)}{\sqrt{Q(LL_k)}}$, to each filter coefficient in the high pass filtering operation over the HL_k and HH_k subband;

$Q(HL_k)$ and $Q(LL_k)$ being the quantization thresholds of the subbands, HL and LL in the k^{th} level, respectively, K being the total level of the DWT, k being a positive integer less than or equal to K, $Q(LL_k)$ being 1 when k is less than K, and LL_1 being the input image.